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Taketo Takeuchi

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1 RECORD OF ORAL HEARING
2 UNITED STATES PATENT AND TRADEMARK OFFICE

3
4 BEFORE THE BOARD OF PATENT APPEALS
5 AND INTERFERENCES

6
7 *Ex Parte* TAKETO TAKEUCHI

8
9 Appeal 2010-000888
10 Application 10/559,870
11 Technology Center 2800

12 Oral Hearing Held: October 12, 2010
13

14 Before ROBERT E. NAPPI, JOSEPH F. RUGGIERO, and
15 ELENI MANTIS MERCADER, *Administrative Patent Judges*.

16 APPEARANCES:
17

18 ON BEHALF OF THE APPELLANT:
19

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1 The above-entitled matter came on for hearing on Tuesday,
2 October 12, 2010, commencing at 10:03 a.m., at the U.S. Patent and
3 Trademark Office, 600 Dulany Street, Alexandria, Virginia, before Victor
4 Lindsay, a Notary Public.

5 THE USHER: Calendar No. 9, Appeal No. 2010-000888,
6 Mr. Schulte.

7 JUDGE NAPPI: Good morning, Mr. Schulte.

8 MR. SCHULTE: Morning, Your Honor.

9 JUDGE NAPPI: Can I ask that you give the stenographer a copy of
10 your business card so we get the spelling of your name for the record?

11 MR. SCHULTE: Sure.

12 COURT REPORTER: Thank you very much.

13 JUDGE NAPPI: I see you have visual aids.

14 MR. SCHULTE: Yes.

15 JUDGE NAPPI: My standard question is have you [sic] all been
16 presented to the Examiner?

17 MR. SCHULTE: Yes.

18 JUDGE NAPPI: Okay.

19 MR. SCHULTE: These are just drawings. All I did was -- and I'll
20 show you in a second -- was copy the last two paragraphs of Claims 1 and 9,
21 illustrate the top graph of our Figure 7, and then illustrate the prior art's
22 Figure 2B.

23 JUDGE NAPPI: Okay.

24 MR. SCHULTE: I think the only thing I did really is, on our Figure 7,
25 just color just to make it easier to view. Actually, the two pieces of prior art

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1 I'm going to be talking about, the first one -- one of them is Matsunaga, and
2 the other one I'll give you a spelling in a second. The second reference I'll
3 be discussing is Shimazaki, which is S-h-i-m-a-z-a-k-i.

4 All right. Ready to begin?

5 JUDGE NAPPI: Yeah.

6 MR. SCHULTE: Good morning, Your Honor. My name is Scott
7 Schulte with Oliff and Berridge. I'm here to represent Aisin AW in this
8 appeal. What our application is directed to is a vehicle motor. More
9 specific to that is controlling the torque of a vehicle motor, and more
10 specific to that is controlling the torque of a vehicle motor when the vehicle
11 is stalled.

12 Before getting into the single 103 rejection over Matsunaga and
13 Shimazaki, just to briefly explain the claims, I want to produce -- in this
14 bottom chart, in the last two paragraphs of Claims 1 and 9 -- sorry about that
15 --

16 JUDGE NAPPI: It's okay. If it's 1 and 9, we have them in front of us
17 on the --

18 MR. SCHULTE: Last two paragraphs of Claims 1 and 9. And
19 specifically, the features that are highlighted is the fact that the torque of our
20 vehicle motor is reduced when a stalled state of the vehicle is detected and
21 when a selected temperature exceeds a restrictive temperature. I'll be
22 emphasizing the temperature aspect. And a second feature is the fact that
23 this selected temperature is from a coil where a maximum current flow is
24 detected.

25

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1 Now, what does that mean specifically? According to our invention --
2 like I say, we got a vehicle motor. A vehicle motor, when it rotates, goes
3 between the U, V and W phases. When you're in a stalled state, you don't
4 want to be stuck in a certain coil because, if you do, you're going to overheat
5 that coil and damage your motor.

6 So what we're doing in our invention is we're comparing temperatures,
7 a selected temperature to a restrictive temperature. So for example, in this
8 example, let's say, when you're stalled, you're stuck on the U phase, we are
9 going to monitor the temperature, i.e. the selected temperature of the U
10 phase coil, because it's the coil where the maximum current is detected. And
11 we're going to monitor the temperature until it reaches this predetermined
12 restrictive temperature. Once it does that, then, according to our claim, we
13 are going to reduce the torque because you're in a stalled state. And that's
14 like the temperature exceeds a restrictive temperature just going -- like I
15 said, will reduce torque, vehicle moves backwards, goes to the next coil,
16 which in this case would be the W phase, again, at time T-2 goes into a
17 stalled state, and now we're going to monitor this selected temperature
18 because it's a temperature where the max -- it's the coil where the maximum
19 current flow is detected.

20 And if I keep doing that, we want to achieve two things. One, by
21 maintaining at a coil, we believe we can actually achieve a higher torque
22 when we're in a stalled state. And secondly, we're going to actually reduce it
23 when it hits a certain temperature because, again, you want to avoid burning
24 that specific coil. So again, with our claims, again, we're monitoring
25 temperature.

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1 Now, we think the Examiner's rejection -- the prior art is wrong for
2 two reasons. The first reason is the fact that we do not believe that
3 Matsunaga discloses comparing temperature, a selected temperature
4 exceeding a restrictive temperature. We also think the Examiner is wrong
5 with the secondary feature saying that the selected temperature is from a coil
6 where a maximum current flow is detected. The Examiner is relying on
7 Shimazaki for this feature and has admitted that Matsunaga fails to disclose
8 the feature cited in this last paragraph.

9 Now, going to the first feature as to why we believe that Matsunaga
10 fails to compare temperatures, because if you look at Matsunaga, again, they
11 want to -- the goal they're mentioning is to avoid overheating -- I've added
12 this part here -- is to avoid overheating, and that could be found at the end of
13 the flow chart and description.

14 Now, on their flow chart, at this step a stalled state has already been
15 detected. But what they're going to do in order to reduce torque, two
16 conditions for them have to be met, that the restrictive torque has to be less
17 than the torque demand, torque demand being based on how much you
18 pressed on the accelerator and whether or not the phase domain is the
19 same -- again, they're not comparing the temperatures. They're simply --

20 JUDGE NAPPI: Well, isn't the temperature up in the prior steps, in
21 25 and 26?

22 MR. SCHULTE: Yes, Your Honor --

23 JUDGE NAPPI: I'm sorry, 25 and 27?

24 MR. SCHULTE: Correct. What they're doing is they're estimating
25 the hottest temperature, and I don't have this figure in front of me, but in
26

1 other figures they're using that to actually determine the restrictive torque,
2 and that restrictive torque goes down as the temperature goes up, but they're
3 not -- that's all the temperature is being used for. They're not comparing a
4 temperature to another temperature or, for our case, a restrictive temperature.
5 They're saying if it's less than this torque demand, which, again, has nothing
6 to do with the temperature, which is more just based on how much the driver
7 is accelerating or pressing down on the accelerator, as well as other factors,
8 none of which are related to the temperature. So again, he's comparing
9 torques, and then, obviously, in this step, he's seeing if the phase domain is
10 the same.

11 So again, in a very simple way, he does not compare temperature and
12 therefore fails -- we believe that he fails to disclose the features. And in this
13 paragraph, in the second to last paragraph of Claims 1 and 9 --

14 JUDGE MANTIS MERCADER: Counselor, in Figure 3 of
15 Matsunaga, it shows that the temperature -- at 140 degrees Celsius the torque
16 is starting to decrease when that happens. Isn't that equivalent to what you're
17 doing on Figure 5 of your invention? You detect the restrictive temperature
18 and then the torque goes down, you're reducing the torque?

19 MR. SCHULTE: I'd have to re-review our figure, but torque should
20 go down as the temperature goes up.

21 JUDGE MANTIS MERCADER: What I'm saying is, as I'm reading
22 your limitations, is that they're detecting a restrictive temperature and then
23 the torque goes down?

24 MR. SCHULTE: I don't think so, Your Honor, because I know if you
25 look at our description, our discussion of our Figure 7 is we're actually
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1 looking at temperature as a step. And I'd have to revisit our Figure 5 -- and I
2 do believe it's different because, again, we're specifically looking at
3 temperature. They're looking at torque. The only comparison they have
4 with restrictive torque, the only comparison they're making is to this torque
5 demand.

6 JUDGE MANTIS MERCADER: Do you have Figure 3 in front of
7 you? Can you take a look at it, please?

8 MR. SCHULTE: I have the --

9 JUDGE MANTIS MERCADER: Or you can come -- you can step
10 over here, and I'll show you.

11 MR. SCHULTE: Okay.

12 JUDGE MANTIS MERCADER: That will be probably the fastest
13 way.

14 MR. SCHULTE: Right.

15 JUDGE MANTIS MERCADER: If you look at Matsunaga, Figure 3,
16 you see there is a restrictive torque --

17 MR. SCHULTE: Correct. The restrictive torque goes down as the
18 temperature goes up, or the estimated temperature goes up.

19 JUDGE MANTIS MERCADER: Right. So isn't that inherent that
20 when the temperature reaches 140, that will be the restrictive temperature
21 and the torque will go down? That's included in Steps S-25 and S-27.

22 MR. SCHULTE: I don't see -- the reason -- I'm trying to make a
23 comparison on what are they comparing it to. Obviously, the restrictive
24 torque goes down as -- their restrictive torque goes down as the temperature
25 goes up. But I'm still thinking about what are they comparing it to as far as a
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1 predetermined temperature, because the problem with the prior art is if their
2 torque demand is less than their restrictive torque, they're not going to
3 switch, irregardless of the temperature.

4 JUDGE NAPPI: But once the torque command is above, equal to or
5 above the restrictive torque --

6 MR. SCHULTE: Then they're going to --

7 JUDGE NAPPI: At Step 29 there, it basically becomes a straight line.
8 So why aren't you comparing --

9 MR. SCHULTE: Right. Their phase domain --

10 JUDGE NAPPI: -- temperature at that point in time?

11 MR. SCHULTE: Your Honor, I don't see that temperature is being
12 compared to -- because -- and the reason why I don't believe they disclose
13 this is because TC really has nothing to do with temperature. It's just a
14 torque demand based on how much a vehicle is operating. So although this
15 value goes down as the temperature goes up, there is -- that's why we don't
16 believe that they -- and because this value has nothing to do with
17 temperature, we don't believe they're comparing temperatures -- just seeing
18 if the selected temperature -- restrictive torque. And again, if this condition
19 has to be satisfied for them to move -- torques, selective torque, has to be
20 satisfied for it to go down.

21 And we believe there is a benefit to using our invention versus the
22 prior art. We believe that they know that there's an overheated state that's
23 out there. Well, we believe they are prematurely switching torque. This
24 could be -- the temperature could be high. And like I said, if the TC is
25 higher, then obviously it's going to switch. But then again, TR, the
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1 temperature, could be very low. It could be on the left-hand side. And if TC
2 is high enough, they're going to switch. So the temperature could be high, it
3 could be low, but if this condition is satisfied, they're going to switch.

4 JUDGE NAPPI: No. Because this goes back to what my colleague
5 was saying with Figure 5. If the temperature is below, there is no
6 adjustment. It's not until it's after 140 that there's adjustment down.

7 MR. SCHULTE: But you're -- but to do that, you're assuming that TC
8 is less than TR.

9 JUDGE NAPPI: But if TC and TR are the same, that's Step 27 of
10 calculating the limitation.

11 MR. SCHULTE: All right. It won't -- the answer will be no --

12 JUDGE NAPPI: It'll adjust -- yeah. You'll always go straight through
13 Step 29. So 27, which is the step of calculating the torque $T_{sub T}$ from T_J
14 max --

15 MR. SCHULTE: T of R of T_J max --

16 JUDGE NAPPI: Yeah.

17 MR. SCHULTE: But Your Honor, if -- let's take -- let's say it's cool.
18 Let's say it's on the left-hand side of Figure --

19 JUDGE NAPPI: 5.

20 MR. SCHULTE: Figure 5, thank you -- of Figure 5. If TC is greater
21 than, or TC is greater than --

22 JUDGE NAPPI: I'm sorry, Figure 3. Just -- I'm sorry --

23 MR. SCHULTE: I'm sorry, Figure 3 --

24 JUDGE NAPPI: So it's right on the record.

25

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1 MR. SCHULTE: But like I said, even if you look on the left-hand
2 side of Figure 3, if TR -- I'm sorry, if TC is greater than, or another way of
3 saying it, TR is less than TC, if this is cold or if it's hot, it's going to switch
4 the domain, and that's why we don't believe that they select temperatures,
5 because again, for the reasons you mentioned, you're right. If this keeps
6 going down and this torque is higher than that, then -- or if TR is less, then
7 it'll switch, but -- and likewise, if TR is on the left-hand side of Figure 3 and
8 you have a relatively high TR, for example, if TC is greater than, or another
9 way of saying it, TR is less than, it's going to switch through.

10 Now, whether or not you're going to have a TC that's greater than a
11 TR in Figure -- when that's going to occur, that's really a guess. I don't think
12 that's discussed in the prior art. I mean, the prior art just talks about
13 determining TR based on the junction temperature. But again -- and this is
14 just coming from the grab -- TC, which has nothing -- is greater than,
15 irregardless of TR and irregardless of temperature, it's going to switch.

16 And then so we sort of guess as to what TC, whether it will or will not
17 be greater than, but that's not in the prior art, because what the Examiner --
18 and this is what we disagree with -- the point we argue with the Examiner is
19 I think he's trying to extrapolate from the term overheated state, the concept
20 that because there's an overheated state, we believe that there is a
21 temperature we want to avoid and because there's a temperature we want to
22 avoid, we're somehow comparing temperatures. And that's in the
23 Examiner's Answer.

24 And like I said, we disagree with it for several reasons. One of the
25 reasons is because we don't think that interpretation is supported by the prior
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1 art. We think it's really based -- technically, we really think it's based on
2 hindsight. Another reason that she could have extrapolated the meaning of
3 overheated state is by, again, looking at our specification and claims. And
4 two, I think it ignores how it actually works. Again, phase domain we have
5 a focus on, and the other condition being these torques. And again, just to
6 emphasize, this has nothing to do with temperature, and if this is greater than
7 TR, irregardless of the temperature, it's going to --

8 JUDGE NAPPI: It's going to limit the torque to TR, the restrictive
9 torque.

10 MR. SCHULTE: Well, TC is not based --

11 JUDGE NAPPI: TC is a commanded torque. TR is a restrictive
12 torque.

13 MR. SCHULTE: Right.

14 JUDGE NAPPI: So when TC -- when you try to demand more from
15 the motor than it's going to give, you get the restrictive torque.

16 MR. SCHULTE: I don't think -- I think if you want more from the --
17 more torque from the motor than it's able to give, and that can change based
18 on if it's going to restrict, if TC -- and I'm just going to throw out the
19 numbers initially -- if TC is 10, for example, and on the left-hand side of that
20 chart, if it's a low temperature, TR is -- restrictive torque is 9, and then when
21 it's a hotter temperature TR goes down to 4, well, in both scenarios, TC is
22 10. That's both scenarios TC is greater than TR. And it's going to, if the
23 phase domain switch is the same, it's going to reduce torque. And that's
24 what I mean, that if the torque demand -- if you want more than the motor,
25 as long as that condition is met, then it's going to reduce.

26

1 JUDGE NAPPI: Yes, but when you put the Figure 3 in, which
2 corresponds to Step 27, it's going to reduce -- what Figure 3 shows is that
3 TR is flat. It's a fixed value --

4 MR. SCHULTE: To a certain point --

5 JUDGE NAPPI: -- up until a certain temperature. And then beyond
6 that temperature, it starts reducing it.

7 MR. SCHULTE: Correct.

8 JUDGE NAPPI: Okay. So that equation that we just talked about,
9 where TC is greater than TR, is going to be one thing above the
10 temperature -- I'm sorry, it's going to be flat below the temperature, and once
11 you get above 140, it's going to reduce. And I guess the question becomes
12 why doesn't that meet your claim where it says wherein the torque in the
13 motor vehicle is reduced when a selected temperature exceeds the restrictive
14 temperature?

15 MR. SCHULTE: Well, I think the one thing that I think you're
16 assuming is that TC is constant. It's not discussed in the prior art, but I can't
17 imagine during the course of driving a vehicle TC is maintaining constant.

18 JUDGE NAPPI: But we only need one mode of operation that meets
19 your claim and anticipates, or in this case, to make obvious your claim.

20 MR. SCHULTE: But if TC --

21 JUDGE NAPPI: The fact that he puts Step 29 in means he anticipates
22 at some point in time TC might be greater than TR.

23 MR. SCHULTE: Right. Correct. And then when is TC greater
24 than -- I'm sorry, when is --

25 JUDGE NAPPI: When TC is --

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1 MR. SCHULTE: -- TC is greater than TR and when is it less than
2 TR?

3 JUDGE NAPPI: But when it's greater than TR, then the question
4 becomes why doesn't that meet your claim? Maybe it's not on this feature. I
5 don't know. That's fine.

6 MR. SCHULTE: I still don't believe that, and the reason I don't
7 believe is because this has really nothing to do with temperature, that they're
8 not comparing temperatures, and that --

9 JUDGE NAPPI: No. The Step 27 is the step which is comparing
10 temperatures.

11 JUDGE MANTIS MERCADER: Right. TR --

12 MR. SCHULTE: But you're calculating TR --

13 JUDGE NAPPI: I know, but if --

14 JUDGE MANTIS MERCADER: Right.

15 JUDGE NAPPI: The calculation of TR is showing that it's flat below
16 a certain temperature and then diminishes after that temperature.

17 MR. SCHULTE: See --

18 JUDGE NAPPI: And you're not -- actually, in Claim 1 I'm looking at
19 right now, you're not saying you're comparing. You're saying the torque is
20 reduced when a temperature exceeds a restrictive temperature?

21 MR. SCHULTE: Correct.

22 JUDGE NAPPI: And that describes Figure 3. It's flat, and then above
23 a restrictive temperature, it's reduced. So our question is, is why doesn't that
24 meet the claim?

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1 MR. SCHULTE: Because they are not determining whether or not a
2 selected temperature exceeds a restrictive temperature. You can consider the
3 temperature in Figure 3 as being a restrictive temperature. But they're
4 reducing torque -- I mean they're reducing TR.

5 JUDGE NAPPI: They're reducing TR, which does relate to the torque
6 of the vehicle.

7 MR. SCHULTE: But they're not -- doesn't seem like they're looking
8 to see if that restrictive [sic] temperature exceeds a restrictive temperature,
9 or if that -- if the selected temperature exceeds a restrictive temperature. I'm
10 assuming you're taking from the chart that TR is a restrictive temperature?
11 I --

12 JUDGE NAPPI: TJ max. TR is torque.

13 MR. SCHULTE: TJ -- TR -- so you're considering TJ to be the
14 selected temperature?

15 JUDGE NAPPI: Is that what the Examiner did? That's my
16 understanding --

17 MR. SCHULTE: The Examiner didn't take any of this. I mean he
18 just --

19 JUDGE NAPPI: Oh --

20 JUDGE MANTIS MERCADER: The Examiner just --

21 MR. SCHULTE: -- I think extrapolated from overheated state the fact
22 that you're comparing temperatures.

23 JUDGE NAPPI: Okay.

24 MR. SCHULTE: Again, I think on the -- of what is selected
25 temperature and what is restrictive temperature.

26

1 JUDGE MANTIS MERCADER: But TR is the torque at the
2 restrictive temperature, so --

3 MR. SCHULTE: Okay. So if you take -- so what would be the
4 selected temperature?

5 JUDGE MANTIS MERCADER: So the restrictive temperature
6 would be 140 degrees Celsius. That's when it starts going down.

7 MR. SCHULTE: Okay. And the selected temperature would be?

8 JUDGE MANTIS MERCADER: 140.

9 JUDGE NAPPI: No. The selected is the one you're comparing to
10 140.

11 JUDGE MANTIS MERCADER: Oh. It would be like whatever -- if
12 it exceeds 140, then the torque would be going down -- whatever that
13 temperature is.

14 JUDGE NAPPI: Which I guess is the temperature S-23?

15 MR. SCHULTE: But if you take the -- well, I think with Figure 3,
16 isn't that you're monitoring a temperature? Basically, you're calculating a
17 temperature, estimating a temperature. You're taking that temperature and
18 comparing it to that Figure 3 to get a restrictive torque. So you're never
19 looking at a value above that temperature in Figure 3. It's just chart of
20 what's the temperature and then the torque goes down. But I don't know if it
21 goes -- if the next time you cycle through the flow chart, if the temperature
22 goes higher, you're really going across -- you get your findings in the next --
23 what the TR would be with that new temperature. That's why I'm not sure
24 what you consider to be a selected temperature.

25

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1 JUDGE NAPPI: Well, does the Examiner rely on -- and I can't
2 pronounce that second reference --

3 MR. SCHULTE: The Examiners rely on the second reference for the
4 concept that the maximum, or the highest, temperature would come from the
5 coil with -- the coil with the maximum current is the coil with the maximum
6 temperature, and we disagree with that reason. And Matsunaga fails to
7 disclose this feature and -- drawing on the fact that Shimazaki discloses
8 maximum -- coil with the maximum temperature is the coil with the
9 maximum current, and we disagree. I think the easiest way to explain that,
10 why we disagree, is if you look at this time immediately after Time 2, the
11 current has been taken away from the U phase. However, the U phase has a
12 higher temperature. And at this point, the W phase has a maximum current
13 because that's where the maximum current is flowing through.

14 So again, we all think that it's not necessarily true that a maximum --
15 the coil with the maximum temperature is the coil with the maximum current
16 because you're probably going to have to worry about this is the total
17 maximum current and this the coil with the maximum current. And again, I
18 guess the easiest one is the analogy with the light bulb. If you have a light
19 bulb on all day and you turn it off and turn on another one, well, that light
20 bulb is still hotter than the one that you just turned on. So again, we don't
21 think that's wrong. And again, we don't also know -- the reason is that we
22 don't think the prior art discloses that.

23 So I guess to summarize, we still think he's wrong about taking --
24 about comparing a selected temperature to a restrictive temperature because,
25 again, it doesn't mention comparing temperatures, he's mentioned comparing
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1 torques, and that this value right here is not related to temperature. And
2 therefore, just take them from the chart, and we don't believe he's comparing
3 temperatures. He sets up torque based on temperature, but he's not
4 comparing temperatures. That's all I have.

5 JUDGE NAPPI: Okay. Any questions? Eleni?

6 JUDGE MANTIS MERCADER: No.

7 JUDGE NAPPI: Okay.

8 Whereupon, the proceedings, at 10:26 a.m., were concluded.

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